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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,847	11/25/2003	Satchidanand Mishra	A11451	6934

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XEROX CORPORATION
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EXAMINER	
THOMAS, LUCY M	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/721,847	MISHRA ET AL.	
	Examiner	Art Unit	
	Lucy Thomas	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/25/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because element 130 recited in the specification on page 5, line 2 is missing in Figure 5 and "the black members" recited on page 7, line 18 is missing in Figure 7. Also, recitation of "electrode 200" on page 5, paragraph 20, and "elements 200 and 250" on page 6, line 3 of the specification are not supported by any of the Figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1, 7, 14, 15, 20 and 22 are objected to because of the following informalities: Claim 1 is objected to being indefinite as the claim states that "the elements further being arranged in a profile that reduces shielding effects" however, there is no support in the claim for providing such a structure.

Recitation of "pins at edges of the array being more closely packed than the pins near the center of the array" in line 2-3, Claim 7 is not supported by the disclosure. Claims 14 and 22 recites the limitation "the corotron electrode elements" in line 3-4 and 5-6 respectively. There is insufficient antecedent basis for this limitation in the claims.

Claims 15 and 22 recites and element "h" in line 3-4 and 10-11 respectively, but no explanation of what the element refers to has been provided.

Regarding claim 20, the phrase "to project less than elements" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-6, 8-12, 18-23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of U.S. Patent No. 6,909,867. Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 1-2 of both the current invention and U.S. Patent No. 6,909,867 discloses a corona producing device comprising: corona producing elements arranged in at least one group; the elements being directed at and spaced from a charge retentive surface where the elements include an array of pins projecting toward the charge retentive surface, pins at edges of the array projecting less than pins toward a center of the array, the elements further being arranged in a profile that reduces shielding effects; a power source connected to the at least one plurality of corona producing elements; and supports to which the at least one plurality of corona producing elements are attached. The above set of claims differs in that the Application Claim 1 limits the corona producing elements only as a group compared to as an array in the Patent Claim 1, and the limitation as an array is recited in Claim 2 of the Application. Claim 1 is broader in that it recites that the elements are "arranged in a profile that reduces shielding effects." This has been claimed, however, it is not clear from the claim how recitation is supported. As disclosed by the Applicant, it is the recitation that "array project less than elements toward the center of the array" would be required to support this claimed limitation. Claim 3 of both the Application and the Patent discloses a corona producing device, wherein the array of pins comprises a first

line of pins with pins projecting further toward the charge retentive surface in accordance with their proximity to a center of the first line of pins. Claim 4 of the Application and Claims 4-6 the Patent discloses a corona producing device, further comprising bores into which the pins are inserted and in which the pins are held and the depth of pin insertion can be varied to adjust the degree to which the pins project toward the charge retentive surface. The Patent Claims 4-6 differs in that it discloses a block (Claim 4), which includes the bores, whereas the Application Claim 4 doesn't disclose a block. It is obvious that the bores has to be on a surface or a block.

Claims 5-6 of the Application and Claims 7-8 of the Patent discloses a corona producing device, wherein the array of pins further comprises at least a second substantially parallel line of pins whose pins project further toward the charge retentive surface in accordance with their proximity to edges of the second substantially parallel line of pins. Claims 8-9 of the Application and Claims 9-10 of the Patent discloses a corona producing device, wherein elements comprise an array of teeth projecting toward the charge retentive surface, teeth at edges of the array projecting less than teeth toward a center of the array and the array of teeth comprises a first line of teeth with teeth projecting further toward the charge retentive surface in accordance with their proximity to a center of the first line of teeth. Claims 10-12 and 16 of the Application and Claims 11-13 of the Patent discloses a corona producing device, wherein the first line of teeth includes teeth of a substantial sawtooth configuration, the first line of teeth comprises a stamped sheet of metal, and the apparatus/method wherein the profile is determined by iterative adjustment of the elements of the at least one plurality of corona

producing elements so that an electric field at substantially all points is substantially equal.

Claims 18-21 of the Application and Claims 23-26 of the Patent discloses a method of substantially uniformly charging a charge retentive surface comprising: attaching corona charging elements to a power source; determining a respective electric field distribution over the corona charging elements; if the respective electric field is substantially non-uniform, adjusting corona charging elements; and repeating the determining and adjusting until the electric field is substantially uniform (Application Claim 18, Patent Claim 23), attaching corona charging elements to a power source includes mounting elements in at least one group on a conductive surface and substantially perpendicular to the conductive surface so as to project toward the charge retentive surface (Application Claim 19, Patent Claim 24), sizing elements on an edge of a plurality of elements to project less than elements toward a center of the plurality (Application Claim 20, Patent Claim 25), and altering a curvature of a conductive surface so that elements at an edge of a plurality of elements are farther from the charge retentive surface than elements toward a center of the plurality (Application Claim 22, Patent Claim 26). The above group of Claims differs in that the plurality limitation is applied differently. For example, Claims 20 and 21 of the Application and Claims 23 and 24 of the Patent are limited by plurality of elements. It would be obvious to extend this to a plurality elements to provide increased discharging capability.

Claims 14, 22 and 27 of the Patent discloses a formula derived from solving the Laplace Equation, for calculating the electric field at a point of interest (x, y) in space,

which is also recited in Claims 14-15, 17, and 22-23 of the Application. Claims 15-21 of the Patent basically discloses an apparatus with the of a corona producing device as disclosed by Claims 1-6 of the Application.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Mishra et al. (US 5,300,986). Mishra et al. discloses a corona producing device (Figures 3, 4) comprising: corona producing elements 114 arranged in at least one group; the elements being directed at and spaced from a charge retentive surface 20; the elements further being arranged a profile that reduces shielding effects; a power source (see Figure 3) connected to the at least one plurality of corona producing elements; and supports 116 to which the at least one plurality of corona producing elements are attached.

7. Claims 13-18 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Walsh et al. (The Negative Corona Distribution for a Long Pin-to Plane Geometry). Regarding Claim 13, Walsh et al. discloses a corona producing element profile determination method comprising determining the electrical potential in space, determining the spatial variation of the field, determining the potential in space comprising determining an electrical potential at points throughout a region between a

charge-producing array of the corona producing elements and a photoreceptor of a marking machine (Page 104-108, Figures 10, 11). Regarding Claims 14 and 15, Walsh discloses the method of profile determination including solving the Laplace equation as recited in Claim 14 and electric field components as recited in Claim 15 (Page 104, Column 2), except that the calculations are shown in spherical coordinate system, instead of Cartesian coordinate system as recited in Claims 14 and 15. Claim 17 expresses the magnitude of the electric field expressed in component form in Claim 15. However, the selection of coordinate system is typically based on the symmetry for reducing the number of steps involved in the calculation of quantities of interest to simplify calculations. Regarding the method Claim 16, one would necessarily perform the steps to obtain a substantially uniform electric field to produce high quality images. Clam 18 basically recites the steps of method Claims 13 and 16, except that Claim 18 recites as steps to charge a charge retentive surface, whereas Claim 13 and 16 recites as steps for element profile determination. Claims 22-23 discloses the Laplace equation and electric field components and its magnitude as recited in Claims 13-15, and 17 except that Claim 13-15 and 17 recites the steps as part of charge profile determination whereas Claims 22-23 recites the steps as part of charging a charge retentive surface. Therefore, please see the rejection for Claims 13-15, and 17 above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388). Regarding Claims 2-3, Mishra fails to disclose a corona producing device, wherein the elements include an array of pins projecting toward the charge retentive surface, pins at edges of the array projecting less than pins toward a center of the array as recited in Claim 2, and an array of pins comprises a first line of pins projecting further toward the charge retentive surface in accordance with their proximity to a center of the first line of pins as recited in Claim 3. Crosky et al. discloses a device to atomize coating material, wherein the elements include an array of pins 80 projecting toward the charge retentive surface, pins at edges of the array projecting less than pins toward a center of the array, and the array of pins comprises a first line of pins projecting further toward the charge retentive surface in accordance with their proximity to a center of the first line of pins (Figure 3, Column 1, lines 15-33, Column 3, lines 12-19). It would have been obvious to those skilled in the art to modify Mishra's device to include an array of pins or array of pins with a first line of pins as taught by Crosky, because shorter pins at the edge of the array eliminate the non uniform shielding effect at the edges and thus provide a uniform charge density and potential profile.

10. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388) and Darty (US 6,899,854). Regarding Claim 5 and 6, neither Mishra or Crosky disclose an array of

pins further comprises at least a second substantially parallel line of pins whose pins project further toward the charge retentive surface in accordance with their proximity to edges of the second substantially parallel line of pins (Claim 5), wherein the degree of projection also varies with the line of pins in which the lines are held. Darty discloses arrays of multiple electrodes for the projection of ions from a corona chamber to form the charge pattern (Column 1, lines 12-28). It would have been obvious to modify the device of Mishra and Crosky to include a second substantially parallel line of pins as taught by Darty to facilitate more flexibility for efficient and uniform charge transfer to produce high quality images.

11. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388) and Yonekawa et al. (US 6,208,499). Claims 8 and 9 recites elements of Claim 2 and 3 limiting corona producing elements as an array of teeth, instead of pins. Neither Mishra or Crosky disclose an array of teeth. Yonekawa discloses a corona discharge device with an array of teeth. It would have been obvious to those skilled in the art at the time the invention was made to modify the device of Mishra and Crosky with an array of teeth as taught by Yonekawa to increase the sharpness of the electrode to reduce the amount of ozone generated and thus to increase the environmental protection. Yonekawa further discloses that a first line of teeth includes teeth of a substantial sawtooth configuration (Figure 1, Column 2, lines 44-49) as recited in Claim 10, which comprises a stamped sheet of metal (Column 3, lines 56-67) as recited in Claim 11. It would have been obvious to those skilled in the art at the time the invention was made to modify the

device of Mishra and Crosky with a first line of teeth includes teeth of a substantial sawtooth configuration which comprises stamped sheet of metal as taught by Yonekawa to suppress the generation of ozone and to increase the durability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LT
October 31, 2005

PHUONG T. VU
PRIMARY EXAMINER